

I claim:

1. A fiber coating applicator, comprising:
 - a chamber,
 - a cup positioned over the chamber, the cup connected to the chamber by an
5 entrance aperture,
 - the chamber including an exit aperture opposite the entrance aperture, the cup,
entrance aperture, chamber, and exit aperture defining a pathway for a fiber to be coated,
the chamber further including an input port for pumping a coating material into
the chamber,
 - 10 the entrance aperture being dimensioned such that as a fiber travels along the
pathway and coating material is pumped into the chamber, coating material travels
upward through the entrance aperture around the fiber into the cup, the upward flow of
coating material being restricted by the fiber and entrance aperture such that there is a
hydrostatic pressure in the chamber,
 - 15 the exit aperture being dimensioned to shape coating material around a fiber
traveling along the pathway.
2. The applicator according to claim 1, wherein the cup further includes a
drain port for draining excess coating material out of the cup.
3. The applicator according to claim 1, further including an entrance die
20 assembly mounted into a first opening between the cup and the chamber, the entrance die
assembly including the entrance aperture.
4. The applicator of claim 3, wherein the first opening is threaded to receive
a first set screw, and wherein the entrance die assembly includes a first die insert mounted

into a first fitting, the first fitting held in position by a first set screw that is screwed into the first opening.

5 5. The applicator of claim 1, further including a shaping die assembly mounted into a second opening in the chamber opposite the first opening, the shaping die assembly including the exit aperture.

6. The applicator of claim 5, wherein the second opening is threaded to receive a second set screw, and wherein the shaping die assembly includes a second die insert mounted into a second fitting, the second fitting held in position by a second set screw that is screwed into the second opening.

10 7. The applicator of claim 1, wherein the chamber includes a flexible gooseneck, and wherein the applicator further includes at least one translation stage for adjusting the relative positions of the entrance and exit apertures.

8. The applicator of claim 1,
15 wherein the entrance aperture has a diameter of 30 mils and the exit aperture has a diameter of 9.3 mils,

 wherein the coating material has a viscosity of 40 centipoises,
 and wherein the applicator is used to apply a coating having a thickness of 10-20 microns onto a fiber having a diameter of 200 microns.

9. A system for applying a coating to a fiber, comprising:
20 an applicator having a chamber and a cup positioned over the chamber, the cup connected to the chamber by an entrance aperture, the chamber including an exit aperture opposite the entrance aperture, the cup, entrance aperture, chamber, and exit aperture defining a pathway for a fiber to be coated, the chamber further including an input port

for pumping a coating material into the chamber, the entrance aperture being dimensioned such that as a fiber travels along the pathway and coating material is pumped into the chamber, coating material travels upward through the entrance aperture around the fiber into the cup, the upward flow of coating material being restricted by the fiber and entrance aperture such that there is a hydrostatic pressure in the chamber, the exit aperture being dimensioned to shape coating material around a fiber traveling along the pathway; and

a pump for pumping coating material from a reservoir into the chamber through the input port.

10 10. The system of claim 9, wherein the pump is a peristaltic pump.

11. The system of claim 9, further including a filter for filtering coating material before it enters the chamber.

12. The system of claim 9, wherein the cup includes a drain port for draining excess coating material out of the cup, and wherein the pump recirculates coating material exiting the drain port back to the input port.

13. The system of claim 9, further including:
a monitor for monitoring the thickness of coated fiber exiting the applicator, and
a controller for controlling the pump, the monitor providing feedback to the controller to control the thickness of the coated fiber.

20 14. The system of claim 13, wherein the controller controls the thickness of the coated fiber by controlling the pump speed, thereby controlling the pressure of coating material within the applicator.

15. A fiber coating applicator, comprising:

a body in which there is formed a cup positioned over a chamber, the cup and chamber connected to each other by a first opening,

the body further including a second opening at the base of the chamber opposite the entrance aperture first opening,

5 the body further including an input port into the chamber for pumping a coating material into the chamber, and a drain port leading out of the cup for draining coating material out of the body,

the cup, first opening, chamber, and second opening defining a coating pathway in which a fiber enters the body through the cup, passes through an entrance die mounted
10 into the first opening, passes through the chamber, and exits the body through a shaping die mounted into the second opening,

the entrance die having an entrance aperture dimensioned such that as a fiber travels along the coating pathway and coating material is pumped into the chamber, coating material travels upward through the entrance die around the fiber into the cup,
15 with excess coating material being drained out of the cup through the drain port,

the upward flow of coating material being sufficiently restricted by the fiber and entrance die such that there is a hydrostatic pressure in the chamber.

16. The applicator of claim 15, wherein the first opening is threaded to receive a first set screw to hold the entrance die assembly in position, and wherein the second
20 opening is threaded to receive a second set screw to hold the shaping die assembly in position.

17. The applicator of claim 15, wherein the body includes first and second input ports leading into the chamber, the first and second input ports having different dimensions.

18. A method for coating a fiber, comprising:

5 positioning a cup over a chamber;

threading a fiber to be coated through an entrance aperture between the cup and the chamber, and through a chamber exit aperture opposite the entrance aperture;

pumping coating material into the chamber such that there is counterflow of coating material up through the entrance aperture around the fiber into the cup, and such

10 that there is hydrostatic pressure in the chamber;

passing optical fiber through the entrance aperture, through coating material pumped into the chamber, and out through the exit aperture, the coating material being shaped around the fiber by the exit aperture.

19. The method of claim 18, further including:

15 draining excess coating material out of the cup and recirculating the excess coating material back into the chamber.

20. The method of claim 18, further including:

filtering the coating material before it enters the chamber.